

=====

Sequence Listing was accepted.

If you need help call the Patent Electronic Business Center at (866)  
217-9197 (toll free).

Reviewer: markspencer

Timestamp: [year=2008; month=12; day=4; hr=13; min=50; sec=21; ms=550; ]

=====

Application No: 10813908

Version No: 3.0

Input Set:

Output Set:

Started: 2008-11-12 11:13:34.382

Finished: 2008-11-12 11:13:35.756

Elapsed: 0 hr(s) 0 min(s) 1 sec(s) 374 ms

Total Warnings: 9

Total Errors: 0

No. of SeqIDs Defined: 19

Actual SeqID Count: 19

Error code	Error Description
W 213	Artificial or Unknown found in <213> in SEQ ID (11)
W 213	Artificial or Unknown found in <213> in SEQ ID (12)
W 213	Artificial or Unknown found in <213> in SEQ ID (13)
W 213	Artificial or Unknown found in <213> in SEQ ID (14)
W 213	Artificial or Unknown found in <213> in SEQ ID (15)
W 213	Artificial or Unknown found in <213> in SEQ ID (16)
W 213	Artificial or Unknown found in <213> in SEQ ID (17)
W 213	Artificial or Unknown found in <213> in SEQ ID (18)
W 213	Artificial or Unknown found in <213> in SEQ ID (19)

# SEQUENCE LISTING

<110> Frey, Joachim  
 Stuber, Katja  
 Thornton, Julian C  
 Kuzyk, Michael A  
 Burian, Jan

<120> TYPE III SECRETION PATHWAY IN AEROMONAS SALMONICIDA, AND USES THEREFOR

<130> VA/H-50095

<140> 10813908

<141> 2004-03-26

<150> US 10/416,902

<151> 2003-05-15

<150> PCT/CA01/01589

<151> 2001-11-15

<150> US 60/248,864

<151> 2000-11-15

<160> 19

<170> PatentIn version 3.5

<210> 1

<211> 47

<212> PRT

<213> Aeromonas salmonicida

<400> 1

Glu Leu Lys Arg Leu Ile Arg Leu Leu Pro Val Glu Leu Phe Ser Glu  
 1 5 10 15

Glu Glu Gln Arg Gln Asn Leu Leu Gln Cys Cys Gln Gly Ala Leu Asp  
 20 25 30

Asn Ala Ile Glu Arg Glu Glu Asp Glu Leu Ser Gly Glu Ser Ser  
 35 40 45

<210> 2

<211> 123

<212> PRT

<213> Aeromonas salmonicida

<400> 2

Met Asn Trp Ile Glu Pro Leu Leu Val Gln Phe Cys Gln Asp Leu Gly

1	5	10	15
Ile Thr Ile Gly Asp Asn Pro His Ser Leu Ile Gln Leu Glu Leu Glu			
20	25	30	
Gln Ser Gly Thr Leu Gln Leu Glu Arg His Gln Gly Gln Leu Thr Leu			
35	40	45	
Trp Leu Ala Arg Ala Val Pro Trp His Gln Ser Gly Glu Ala Ile Arg			
50	55	60	
Arg Ala Met Thr Leu Thr Ala Ala Ala Gln Gly Pro Ala Leu Pro Val			
65	70	75	80
Arg Ser Gly Trp Leu Gly Glu Glu Gln Leu Ile Leu Phe Val Ser Leu			
85	90	95	
Asp Glu Arg Ala Val Thr Leu Pro Gln Leu His Gln Ala Val Thr Thr			
100	105	110	
Leu Thr Arg Leu Gln Arg Glu Val Leu Ala Ser			
115	120		
<210> 3			
<211> 121			
<212> PRT			
<213> Aeromonas salmonicida			
<400> 3			
Met Ser Arg Ile Thr Ala Ala His Ile Gly Ile Glu Gln Leu Ser Ala			
1	5	10	15
Ile Ser Leu Asp Asp Gln Glu Arg Ser Leu Pro Gly Arg Tyr Ala Leu			
20	25	30	
Leu Pro Asp Gly Gln Ser Ile Glu Pro His Ile Ser Arg Leu Tyr Pro			
35	40	45	
Glu Arg Leu Ala Asp Arg Val Leu Leu Asp Phe Ala Thr Pro Asp Arg			
50	55	60	
Gly Phe His Asp Leu Leu Arg Pro Val Asp Phe Asn Gln Ala Met Gln			
65	70	75	80

Gly Leu Arg Ser Val Leu Ala Glu Gly Gln Ser Pro Glu Leu Arg Ala  
85 90 95

Ala Ala Ala Leu Leu Glu Gln Met His Ala Asp Glu Gln Leu Met Gln  
100 105 110

Met Thr Leu His Leu Leu His Lys Val  
115 120

<210> 4  
<211> 116  
<212> PRT  
<213> Aeromonas salmonicida

<400> 4

Met Thr Met Val Leu Thr Ser Gln Gln Gln Asp Ala Leu Leu Leu Thr  
1 5 10 15

Gly Trp Leu Gln Leu Gln Tyr Gly His Pro Asp Lys Ala Ser Val Leu  
20 25 30

Leu Ala Ala Leu Leu Gln Ile His Pro Asp His Gln Gly Gly Arg Arg  
35 40 45

Thr Leu Leu Val Ala Leu Leu Lys Gln Gly Glu Gly Glu Ala Ala Leu  
50 55 60

Ala His Val Asp Gln Leu Met Gln Gln Gly Glu Ala Asp Gly Pro Leu  
65 70 75 80

Trp Leu Cys Arg Ser Arg Ala Cys Gln Leu Ala Gly Arg Leu Asp Glu  
85 90 95

Ala Arg Phe Ala Tyr Gln Gln Tyr Leu Glu Leu Glu Glu Gln Asn Glu  
100 105 110

Ser Thr His Pro  
115

<210> 5  
<211> 705  
<212> PRT  
<213> Aeromonas salmonicida

<400> 5

Met Asn Gln Arg Thr Leu Glu Leu Leu Arg Arg Ile Gly Glu Arg Lys  
1 5 10 15

Asp Ile Met Leu Ala Ile Leu Leu Leu Ala Ile Val Phe Met Met Val  
20 25 30

Leu Pro Leu Pro Pro Val Ala Leu Asp Ile Leu Ile Ala Ile Asn Met  
35 40 45

Thr Ile Ser Val Val Leu Leu Met Met Ala Val Tyr Ile Asn Ser Pro  
50 55 60

Leu Gln Phe Ser Ala Phe Pro Ala Val Leu Leu Ile Thr Thr Leu Phe  
65 70 75 80

Arg Leu Ala Leu Ser Val Ser Thr Thr Arg Met Ile Leu Leu Gln Ala  
85 90 95

Asp Ala Gly Gln Ile Val Tyr Thr Phe Gly Asn Phe Val Val Gly Gly  
100 105 110

Asn Leu Val Val Gly Ile Val Ile Phe Leu Ile Ile Thr Ile Val Gln  
115 120 125

Phe Leu Val Ile Thr Lys Gly Ser Glu Arg Val Ala Glu Val Ser Ala  
130 135 140

Arg Phe Ser Leu Asp Ala Met Pro Gly Lys Gln Met Ser Ile Asp Gly  
145 150 155 160

Asp Met Arg Ala Gly Val Ile Asp Val His Glu Ala Arg Asp Arg Arg  
165 170 175

Gly Val Ile Glu Lys Glu Ser Gln Met Phe Gly Ser Met Asp Gly Ala  
180 185 190

Met Lys Phe Val Lys Gly Asp Ala Ile Ala Gly Leu Ile Ile Ile Phe  
195 200 205

Val Asn Ile Leu Gly Gly Val Thr Ile Gly Val Thr Gln Lys Gly Leu  
210 215 220

Ser Ala Ala Asp Ala Leu Gln Leu Tyr Ser Ile Leu Thr Val Gly Asp  
 225 230 235 240

Gly Met Val Ser Gln Val Pro Ala Leu Leu Ile Ala Ile Thr Ala Gly  
 245 250 255

Ile Ile Val Thr Arg Val Ser Ser Glu Glu Ser Ser Asp Leu Gly Thr  
 260 265 270

Asp Ile Gly Ala Gln Val Val Ala Gln Pro Lys Ala Leu Leu Ile Gly  
 275 280 285

Gly Leu Leu Leu Val Leu Phe Gly Leu Ile Pro Gly Phe Pro Met Ile  
 290 295 300

Thr Phe Phe Ala Leu Ser Ala Ile Val Thr Ala Gly Gly Tyr Phe Ile  
 305 310 315 320

Gly Leu Arg Gln Arg Lys Ala Gln Ser Ser Asn Ser Gln Asp Leu Pro  
 325 330 335

Ala Val Leu Ala Gln Gly Ala Gly Ala Pro Ala Ala Arg Ser Lys Pro  
 340 345 350

Lys Pro Gly Ser Lys Pro Arg Gly Lys Leu Gly Glu Lys Glu Glu Phe  
 355 360 365

Ala Met Thr Val Pro Leu Leu Ile Asp Val Asp Ala Ala Leu Gln Ala  
 370 375 380

Glu Leu Glu Ala Ile Ala Leu Asn Asp Glu Leu Val Arg Val Arg Arg  
 385 390 395 400

Ala Leu Tyr Leu Asp Leu Gly Val Pro Phe Pro Gly Ile His Leu Arg  
 405 410 415

Phe Asn Glu Gly Met Gly Pro Gly Glu Tyr Leu Ile Gln Leu Gln Glu  
 420 425 430

Val Pro Val Ala Arg Gly Leu Leu Arg Pro Gly His Gln Leu Val Gln  
 435 440 445

Glu Ser Ala Ser Gln Leu Asp Leu Leu Gly Ile Pro Tyr Glu Glu Gly  
450 455 460

Ala Pro Leu Leu Pro Gly Gln Pro Thr Leu Trp Val Ala Asn Glu His  
465 470 475 480

Gln Glu Arg Leu Glu Lys Ser Arg Leu Ala Thr Leu Thr Thr Asp Gln  
485 490 495

Val Met Thr Trp His Leu Ser His Val Leu Arg Glu Tyr Ala Glu Asp  
500 505 510

Phe Ile Gly Ile Gln Glu Thr Arg Tyr Leu Leu Glu Gln Met Glu Gly  
515 520 525

Ser Tyr Ser Glu Leu Val Lys Glu Ala Gln Arg Ile Ile Pro Leu Gln  
530 535 540

Arg Met Thr Glu Ile Leu Gln Arg Leu Val Gly Glu Asp Ile Ser Ile  
545 550 555 560

Arg Asn Met Arg Ala Ile Leu Glu Ala Met Val Glu Trp Gly Gln Lys  
565 570 575

Glu Lys Asp Val Val Gln Leu Thr Glu Tyr Ile Arg Ser Ser Leu Lys  
580 585 590

Arg Tyr Ile Cys Tyr Lys Tyr Ala Asn Gly Asn Asn Ile Leu Pro Ala  
595 600 605

Tyr Leu Leu Asp Gln Gln Val Glu Glu Gln Leu Arg Gly Gly Ile Arg  
610 615 620

Gln Thr Ser Ala Gly Ser Tyr Leu Ala Leu Asp Pro Thr Ile Thr Gln  
625 630 635 640

Ser Phe Leu Asp Gln Val Arg His Thr Val Gly Asp Leu Ala Gln Met  
645 650 655

Gln Asn Lys Pro Val Leu Ile Val Ser Met Asp Ile Arg Arg Tyr Val  
660 665 670

Arg Lys Leu Ile Glu Gly Asp Tyr His Ala Leu Pro Val Leu Ser Tyr



675

680

685

Gln Glu Leu Thr Gln Gln Ile Asn Ile Gln Pro Leu Gly Arg Val Cys  
690 695 700

Leu  
705

<210> 6  
<211> 93  
<212> PRT  
<213> *Aeromonas salmonicida*

<400> 6

Met Leu Val Arg Arg Glu Gly Glu Arg Ala Gly Leu Ala Asn Pro Phe  
1 5 10 15

Ala Ala Leu Tyr Leu Leu Ala Glu Ala Thr Leu Ala Val Leu Gly Pro  
20 25 30

Gly His Phe Leu Tyr Gly Asn Val Asp Val Phe Arg Ser Ser Ser Leu  
35 40 45

Ser Ser Glu Arg Leu Gly Arg Phe Tyr Leu Arg Trp Thr Gly Ala Ser  
50 55 60

Glu Pro Glu Pro Gly Trp Phe Met Leu Ala Thr Glu Gln Val Cys Ser  
65 70 75 80

Leu Arg Asp Met Arg Lys Arg Gln Lys His Gly Leu Ala  
85 90

<210> 7  
<211> 94  
<212> PRT  
<213> *Aeromonas salmonicida*

<400> 7

Met Lys Gln Pro Arg Phe Ala Asp His Ser Glu Thr Ile Ser Gln Ala  
1 5 10 15

Glu His Gly Ile Ala Asp Ser Asp His Arg Asn Ala Leu Leu Gln Glu  
20 25 30

Met Leu Ala Gly Leu Ala Leu Ser Asp Gln Thr Cys Gln Leu Leu Phe  
35 40 45

Glu Ala Pro Thr Glu Gln Val Ala Val Ala Glu Gln Glu Leu Leu Ala  
50 55 60

Glu Ile Gln Arg Arg Gln Ala Leu Leu Pro Ala Gln Pro Gly Glu Gly  
65 70 75 80

Arg Lys Ser Arg Arg Pro Thr Ile Met Arg Gly Leu Met Ile  
85 90

<210> 8

<211> 361

<212> PRT

<213> Aeromonas salmonicida

<400> 8

Met Ser Thr Ile Pro Asp Tyr Asn Thr Asn Pro Gly Ala Phe Val Gly  
1 5 10 15

Trp Leu Asp Val Gln Ala Leu Asn Thr Leu Pro Gly Asn Lys Asn Pro  
20 25 30

Lys Leu Thr Glu Leu Val Glu Leu Leu Lys Gly Lys Ile Thr Ile Ser  
35 40 45

Ala Asp Ser Ser Thr Ala Leu Ser Lys Glu Gln Leu Glu Lys Leu Leu  
50 55 60

Ala Ala Tyr Leu Thr Asp Pro Ala Ser Ile Asn Gly Gly Trp Ala Met  
65 70 75 80

Gly Gln Phe Lys Gly Gly Gln Asp Ala Ala Ile Ala Ala Ile Lys Gly  
85 90 95

Val Ile Glu Arg Gly Ala Lys Gln Thr Pro Pro Val Thr His Trp Thr  
100 105 110

Ile Pro Glu Phe Met Leu Leu Ser Leu Ser Ala Leu Thr Met Glu Arg  
115 120 125

Thr Asp Asp Asp Leu Ile Thr Thr Phe Thr Gly Val Met Met Phe Gln  
130 135 140

Asp Asn Gln Arg Lys Gly Leu Arg Asp Glu Leu Ala Glu Met Thr Ala  
145 150 155 160

Glu Leu Lys Ile Tyr Gly Val Ile Gln Ser Glu Ile Asn Gln Val Leu  
165 170 175

Ser Ala Ala Ser Asn Gln Thr Phe Lys Thr Asn Phe Asn Leu Met Asp  
180 185 190

Tyr Lys Leu Tyr Gly Tyr Glu Ser Leu Ala Lys Phe Met Glu Gly Gly  
195 200 205

Glu Phe Lys Leu Leu Ser Lys Met Phe Ser Asp Glu Gln Val Thr Lys  
210 215 220

Ala Gln Gln Asp Phe Thr Asn Ala Lys Asn Glu Leu Glu Asn Val Thr  
225 230 235 240

Ser Thr Ser Leu Asn Pro Lys Ile Gln Ala Glu Ala Lys Thr Asp Tyr  
245 250 255

Glu Arg Lys Lys Ala Ile Phe Glu Glu Ile Val Glu Thr Gln Ile Ile  
260 265 270

Thr Leu Lys Thr Phe Leu Glu Ser Asp Leu Lys Lys Ser Gly Ala Met  
275 280 285

Ser Gly Ile Glu Ala Glu Tyr Lys Tyr Asp Lys Asp Asn Asn Lys Leu  
290 295 300

Gly Asn Phe Ser Thr Ser Val Ser Asp Arg Ser Arg Pro Leu Asn Asp  
305 310 315 320

Leu Val Ser Glu Lys Thr Ala Arg Leu Asn Asp Val Ser Ser Arg Tyr  
325 330 335

Asn Ala Ala Ile Glu Ala Leu Asn Arg Phe Ile Gln Lys Tyr Asp Ser  
340 345 350

Ile Met Arg Asp Ile Leu Gly Ala Ile  
355 360

<210> 9  
<211> 159  
<212> PRT  
<213> Aeromonas salmonicida

<400> 9

Met Gln Thr Asp Thr Thr Leu Thr Pro Glu Tyr Glu Ala Glu Leu Glu  
1 5 10 15

Ala Phe Met Ala Asp Gly Gly Thr Leu Ala Met Leu Gln Asp Ile Ser  
20 25 30

Gly Asp Thr Leu Glu Gln Leu Tyr Ala Leu Ala Phe Ser Gln Tyr Gln  
35 40 45

Ala Gly Lys Trp Glu Asp Ala His Lys Ile Phe Gln Ala Leu Cys Met  
50 55 60

Leu Asp His Tyr Glu Pro Arg Tyr Phe Leu Gly Leu Gly Ala Cys Arg  
65 70 75 80

Gln Ala Met Gly Glu Phe Glu Thr Ala Val Gln Ser Tyr Ser Phe Gly  
85 90 95

Ala Met Leu Asp Leu Lys Asp Pro Arg Phe Pro Phe His Ala Gly Glu  
100 105 110

Cys Arg Leu Gln Gln Gly Asp Leu Asn Gly Ala Glu Ser Gly Phe His  
115 120 125

Ser Ala Arg Leu Leu Ala Asp Thr Asp Pro Gln Gln Ala Asp Leu Ala  
130 135 140

Ala Ser Ala Lys Val Met Leu Glu Ala Ile Ala Ile Arg Arg Asp  
145 150 155

<210> 10  
<211> 5678  
<212> DNA  
<213> Aeromonas salmonicida

<400> 10

gagctcaagc ggctgatccg cctgctgccg gtggagctgt tcagtgaaga ggagcagcgc 60

cagaatctgt tgcagtgtcg tcaggggtgcg ctcgataacg ccatcgagcg ggaagaggat 120

gagttgtctg gagagtcgtc atgaactgga ttgaaccctt gctggtgcag ttttgccagg	180
atttgggcat caccataggg gataaccccc attcgtgat ccagcttgaa ctggagcaga	240
gcggcactct gcagctggag cgccatcagg ggcaactgac cctatggttg gccgcgccg	300
tgccttgga tcagagtggc gaggccattc gccgcgccat gacettgact gccgcggcgc	360
aagggccggc actgccggtg cgcagcggct ggttggggga ggagcagttg atcctcttcg	420
tctccctgga tgagcgggccc gtgactctgc ccagctcca tcaggccgtg accaccctga	480
cccggttgca gcgagaggtg ctggcgatcat gagccggatc actgccgcgc atatcggtat	540
cgagcagctc agcgccatct ccctcgacga tcaggagcgc agcctgccgg ggcgttatgc	600
cctgttgccc gatggccagt ccatcgaacc ccatatcagc cgctctacc ccgagcggct	660
ggcggatcgg gtgctgctcg atttcgccac ccggtatcgc ggctttcacg acttgctgcg	720
accggtcgat ttcaatcagg cgatgcaggg gctgcgcagt gtgctggcag aggggcagag	780
ccccgaattg cgagcggccg ccgcgtgct cgaacaaatg cacgccgatg aacaactgat	840
gcagatgacc cttcatctgc tgcacaaggt atgaccatgg tgctta	